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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,746	03/19/2004	Sadayori Hoshina	45616/276001	7670

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EXAMINER	
BOWERS, NATHAN ANDREW	
ART UNIT	**PAPER NUMBER**
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/804,746	HOSHINA ET AL.	
	Examiner	Art Unit	
	NATHAN A. BOWERS	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1) Claims 1, 7 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weinstein (US 6420165) in view of Numata (US 6521444).

With respect to claims 1, 7 and 13, Weinstein discloses an apparatus and method for cleaning a contaminated matter comprising dioxins. The system comprises a reaction tank for holding cells comprising a pellicle of *Bacillus midousuji* cultured in the presence of a chlorinated aromatic compound such as dioxins. Dioxins are a class of molecules that are known in the art to include chlorinated aromatic compounds that have a substituent comprising an oxygen atom bonded to an aromatic ring and a chloro group bonded to an aromatic ring. Weinstein teaches that aqueous solutions of contaminated organic matter are cleansed of dioxin contaminants through the biological action of the *Bacillus midousuji* cells. This is described in column 2, line 66 to column 3, line 25, column 8, lines 23-67 and column 17, lines 65-67. The *Bacillus midousuji* cells degrade dioxin contaminants by breaking the ether bond of the aromatic dioxin ring. Weinstein, however, does not expressly indicate that the *Bacillus midousuji* cells are crushed, fractionated or lysed.

Numata discloses a method for cleaning a contaminated matter by decomposing organic halogenated compounds. Numata teaches in column 3, line 63 to column 4, line 14 and in column 24, lines 26-44 that it is known in the art to crush microorganisms prior to the treatment of contaminated matter in order to prevent undesired effects on the environment.

Weinstein and Numata are analogous art because they are from the same field of endeavor regarding biological decontamination systems.

At the time of the invention, it would have been obvious to crush the cultured *Bacillus midousuji* cells disclosed by Weinstein prior to their introduction into the contaminated matter. As disclosed by Numata, this type of crushing is beneficial because it reduces the environmental impact associated with the delivery of microbes into a sample volume. Although Numata does

state that crushing can be undesirable because it requires expensive equipment and a lot of time and labor, this concern must be considered with the previously stated advantages in mind. If one of ordinary skill in the art, according to an economic calculation, valued the ability to introduce inactive, crushed cells to a sample to remove contaminants over reduced costs and labor, then it would have been obvious to crush the microorganisms of Weinstein prior to decontamination procedures.

With respect to claims 14-16, Weinstein and Numata disclose the system, method and preparation set forth in claims 1, 7 and 13. In addition, Weinstein and Numata each teach that microorganisms are cultured by mixing a contaminant with a medium comprising a nutrient source. As previously noted, Weinstein specifically discloses that dioxin compounds are degraded in the presence of *Bacillus midousuji* cells. Weinstein describes in column 4, lines 51-67 and throughout the reference in general that the cells are grown in the presence of nutrients under aerobic conditions and at an elevated temperature (above 62 degrees Celsius).

2) Claims 1-4, 7-10 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkata (US 6723242) in view of Weinstein (US 6420165) and Numata (US 6521444).

With respect to claims 1, 7 and 13, Ohkata discloses a system and method for cleaning a contaminated matter comprising dioxins by decomposing the dioxins in the contaminated matter. The system comprises a reaction tank (Figure 2:22) for holding cells cultured in the presence of chlorinated aromatic compounds (dioxins) that have a substituent comprising an oxygen atom bonded to an aromatic ring and a chloro group bonded to an aromatic ring. The contaminated matter (Figure 2:K) is introduced to a pre-treatment tank (Figure 2:20) where it is mixed with

water to form an aqueous medium (Figure 2:S1). This is described in column 14, line 61 to column 20, line 7. Ohkata, however, does not expressly indicate that the cells used to degrade the dioxins are *Bacillus midousuji*.

Weinstein discloses an apparatus and method for decomposing dioxin contaminants in an organic waste. Column 2, line 66 to column 3, line 25 and column 8, lines 23-67 state that *Bacillus midousuji* microorganisms are used to degrade dioxins.

Ohkata and Weinstein are analogous art because they are from the same field of endeavor regarding the biological degradation of dioxin contaminants.

At the time of the invention, it would have been obvious to ensure that the microorganisms utilized in the system of Ohkata were *Bacillus midousuji* cells. Ohkata discloses that *Bacillus midousuji* microorganisms are specifically adapted for destroying dioxin contaminant compounds. Since Ohkata states in column 17, line 66 to column 18, line 9 that microorganisms of the genera *Bacillus* are useful in the decontamination system, it would have been apparent use *Bacillus* species, such as *Bacillus midousuji*, that are particularly suited for the decomposition of dioxins.

The combination of Ohkata and Weinstein, however, still differs from Applicant's claimed invention because the references do not expressly indicate that the *Bacillus midousuji* cells are crushed or lysed.

Numata discloses a method for cleaning a contaminated matter by decomposing organic halogenated compounds. Numata teaches in column 3, line 63 to column 4, line 14 and in

column 24, lines 26-44 that it is known in the art to crush microorganisms prior to the treatment of contaminated matter in order to prevent undesired effects on the environment.

Weinstein and Numata are analogous art because they are from the same field of endeavor regarding biological decontamination systems.

At the time of the invention, it would have been obvious to crush the cultured *Bacillus midousuji* cells disclosed by Weinstein prior to their introduction into the contaminated matter. As disclosed by Numata, this type of crushing is beneficial because it reduces the environmental impact associated with the delivery of microbes into a sample volume. Although Numata does state that crushing can be undesirable because it requires expensive equipment and a lot of time and labor, this concern must be considered with the previously stated advantages in mind. If one of ordinary skill in the art, according to an economic calculation, valued the ability to introduce inactive, crushed cells to a sample to remove contaminants over reduced costs and labor, then it would have been obvious to crush the microorganisms of Weinstein prior to decontamination procedures.

With respect to claims 2 and 8, Ohkata, Weinstein and Numata disclose the apparatus and method set forth in claims 1 and 7 as set forth in the 35 U.S.C. 103 rejection above. In addition, Ohkata states that following dioxin degradation, fluids are moved form the reaction tank (Figure 2:22) to a solid-liquid separating tank (Figure 2:23). Processed liquid is removed via transfer line (Figure 2:53), and surplus sludge is removed via a drain (Figure 2:59). Column 27, lines 23-30 state that filtration means are used during solid-liquid separation.

With respect to claims 3, 4, 9 and 10, Ohkata, Weinstein and Numata disclose the apparatus and method set forth in claims 1, 2, 7 and 8 as set forth in the 35 U.S.C. 103 rejections above. Additionally, Ohkata teaches that a pre-treatment tank (Figure 2:20) is provided for soaking contaminated matter (Figure 2:K) with water (Figure 2:L1). A fluid transport means (Figure 2:51) is also provided for transporting the fluid comprising the contaminated matter toward the reaction tank (Figure 2:22). Ohkata, however, does not expressly disclose the use of a seclusion means for secluding a source of the contaminated matter. Regardless, valves that act as secluding means are considered to be notoriously well known in the art. At the time of the invention, it would have been obvious to provide the inlet line transporting the fly ash slurry (Figure 2:K) to the pre-treatment tank with a valve capable of secluding the contaminated matter source from the reaction tanks.

With respect to claims 14-16, Ohkata, Weinstein, Numata disclose the system, method and preparation set forth in claims 1, 7 and 13. In addition, Weinstein and Numata each teach that microorganisms are cultured by mixing a contaminant with a medium comprising a nutrient source. As previously noted, Weinstein specifically discloses that dioxin compounds are degraded in the presence of *Bacillus midousuji* cells. Weinstein describes in column 4, lines 51-67 and throughout the reference in general that the cells are grown in the presence of nutrients under aerobic conditions and at an elevated temperature (above 62 degrees Celsius).

3) Claims 5, 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkata (US 6723242) in view of Weinstein (US 6420165) and Numata (US 6521444) as applied to claims 3, 4, 9 and 10, and further in view of Buchanan (US 5563066).

Ohkata, Weinstein and Numata disclose the apparatus and method set forth in claims 3, 4, 9 and 10 as set forth in the 35 U.S.C. 103 rejection above. Although Ohkata does indicate that water is added to the contaminated matter in the pre-treatment reactor, Ohkata however do not expressly state that water is added using a high pressure washing method.

Buchanan discloses a system for remediating contaminated soil containing organic compounds. Column 4, lines 4-30 and column 11, line 49 to column 12, line 2 states that the contaminated matter is washed by jetting water under high pressure through the holding container using a spray system (Figure 4:40).

Ohkata, Weinstein, Numata and Buchanan are analogous art because they are from the same field of endeavor regarding biochemical systems for cleaning a contaminated matter.

At the time of the invention, it would have been obvious to ensure that the water delivery system disclosed by Ohkata was capable of washing the contaminated matter using a jet of fluids under high pressure. Buchanan states in column 11, line 49 to column 12, line 2 that high pressure spraying is characterized by a shearing action that causes the entirety of the contaminated matter to become a saturated slurry. The use of high pressure spraying helps to ensure that water delivery to all areas of the contaminated matter is uniform and effective. Buchanan states that the creation of an aqueous slurry serves to enable the degradation of contaminants.

Response to Arguments

Applicant's arguments filed 11 March 2008 with respect to the 35 U.S.C. 103 rejections involving Weinstein and Numata have been fully considered but they are not persuasive.

Applicant's principle arguments are

(a) Nothing in Weinstein suggests that the Bacillus midousuji were "cultured in the presence of a chlorinated aromatic compound" as claimed. Weinstein merely teaches that the SH2A and SH2B strains are good producers of industrial enzymes.

In response to Applicant's arguments, please consider the following comments.

Weinstein teaches in column 1, line 65 to column 2, line 11 that the SH2A strain is effectively used to degrade organic contaminants. Weinstein teaches that the cells are cultured in the presence of these contaminants. Figure 6 and column 17, lines 65-67 indicate that the SH2A strain is cultured in the presence of dibenzofuran. Chlorinated dibenzofuran analogs, such as dibenzofuran TCDF, are known in the art.

(b) Weinstein describes the use of live Bacillus midousuji cells. Numata teaches away from using crushed/fractions.

In response to Applicant's arguments, please consider the following comments.

It is agreed that Numata describes both advantages and disadvantages associated with the use of crushed cells for the degradation of organic contaminants. Although Numata states that crushing can be undesirable because it requires expensive equipment and a lot of time and labor, Numata also states that crushing is beneficial because it reduces the environmental impact associated with the delivery of microbes into a sample volume. As noted in the rejection above,

it is well within the purview of one of ordinary skill in the art to weigh these considerations and make a determination regarding whether or not to crush the *Bacillus midousuji* cells disclosed by Weinstein. If an operator valued the ability to introduce inactive, crushed cells to a sample to remove contaminants over reduced costs and labor, then it would have been obvious to crush the microorganisms of Weinstein prior to decontamination procedures.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571) 272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William H. Beisner/
Primary Examiner, Art Unit 1797

/Nathan A Bowers/
Examiner, Art Unit 1797